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FOWLER'S "HETEROGNATHOUS FISHES" WITH A NOTE ON THE STETHAPRIONINAE¹

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At divers times and places I have pointed out that the South American heterognaths, or characins, offer us an unparalleled opportunity for a study of divergent evolution. They probably entered South America in the early Tertiary, when the continent was small and its river systems comparatively insignificant. They have literally grown up with the country, keeping pace with the development of its unrivaled freshwater system. To-day there are over one hundred genera and more than five hundred species known, and only a few spots have been examined. For the most part the genera represent steps along different directions of adaptation.

Every one identifying miscellaneous collections of fishes or other animals, without critical revision of the respective groups, will make numerous mistakes in identification; he will emphasize in his descriptions characters of no importance, and will omit or slur others that are significant. The percentage of mistakes made in identification and the number of unsatisfactory descriptions vary with different men. A large percent is found in the ichthyological writings of the late Professor Cope. His South American freshwater fishes have especially been a source of tribulation for recent writers. It is a thankless task for any naturalist to go over such work and yet this is what Dr. Henry W. Fowler has recently done for the characins.² Dr. Fowler has redescribed many of Cope's species and has supplied illustrations of those not figured or only unsatisfactorily figured before.

It is inevitable that new questions concerning the specimens should arise as the result of Dr. Fowler's work, and that he should

¹ Contribution from the Zoological Laboratory of Indiana University No. 90.

² Further Knowledge of some Heterognathous Fishes. *Proc. Acad. Nat. Sci. Phila.*, 1906, pp. 273-351 and 431-483, 60 figures.

make new mistakes. With the limited material at his command it is to be regretted that Dr. Fowler has not confined himself largely to figuring and describing, instead of bestowing new generic and subgeneric names with princely liberality and abandon. While he has helped by his figures and descriptions, he has in large measure increased, rather than lightened, the burdens of his successors.

The new genera and subgenera proposed by Dr. Fowler (24 in number) are consecutively numbered in the following notes:

1. — *Ophiocephalops*. This is an exact synonym of *Hoplerythrinus* of Gill.

2. — *Copeina*, a new name for the genus *Holotaxis* of Eigenmann, not Cope. This is probably a valid name.

3, 4, 5. — *Curimata* is used for *Curimatus*, although the latter is the earlier form. The genus is divided into the subgenera, (3) *Cyphocharax*, (4) *Steindachnerina*, (5) *Peltapleura*, and *Curimata*. The known species of the genus are not distributed to their respective subgenera and there is no evidence produced in this paper demonstrating that these subgenera are valid or that Dr. Fowler is able to delegate the species to their proper subgenera. *Cyphocharax* and *Curimatus* are probably valid. It is to be hoped that Dr. Fowler will distribute the species for us.

6. — *Eigenmannina*, a new generic name for *Anodus melanopogon* is apparently valid.

7. — *Chilomyzon* is a new subgenus of *Prochilodus*, distinguished by having 33–38 scales in the lateral line, whereas *Prochilodus* is said to have 40–60. This division is unfortunate since *P. humeralis* has 33 scales, *vimboides* 35–37, *oligolepis* 36–38; *longirostris* 38–39, *magdalenae* 40–41, *cephalotes* 41, *asper* and *hartii* 41–42, *brevis* 41–43, *rubrotaeniatus* 44, etc., to the end of the series. The new species, *Prochilodus theraponura* and *amazonensis* are very probably two stages ($2\frac{1}{4}$ and $4\frac{3}{8}$ inches long) of the common *P. insignis*.

8. — *Hemiodopsis*, a subgenus of *Hemiodus*, distinguished by having 100 scales. Since the other species of *Hemiodus* have 58–85 scales this division may be convenient.

9. — *Pithecocharax* is substituted for *Anostomus* because he thinks the latter is preoccupied by *Anostomus Bonnaterra* 1790.

But *Anostomus* was proposed by Gronovius and accepted by Scopoli in his *Introductio ad Historiam Naturalem*, 1777, p. 451. There is no reason for doing away with the name *Anostomus* even if it were identical with *Anastomus*, which it is not.

10. — *Poecilomatops* is proposed for the species of *Characidium* having 4 scales between the anal and the lateral line; the rest have 2 or 3. The advisability of this division may well be questioned, but even if valid, the older name, *Nanognathus* Boulenger, must be used instead of *Poecilomatops*.

11. — *Garmanina* is a valid subgenus of *Rhytiodus*, there being a difference of 30 scales in the lateral line.

12. — *Abramites* (type *hypselonotus*), a new genus, is said to be distinguished from *Leporinus* by its longer anal basis, but where are we to draw the line? There are groups of species of *Leporinus* with 9, 10, 10 or 11, 11, 12, 12 or 13, 13 to 15 (*hypselonotus*), 14, and 15 or 16 rays! The name is not admissible.

Astyanax pectinatus (Cope) redescribed and figured, is the type of a genus distinct from *Astyanax*, differing from all other *Tetragonopterinae* in that the origin of the anal is under or in advance of that of the dorsal. It may be named *Phenacogaster*.¹ *Astyanax moorii* (Boulenger) is the type of a distinct genus which may be named *Astyanacinus*.² *Astyanax atahualpinus* does not seem to be distinct from *Moenkhausia agassizii*, since the differences fall within the limits of the observed variation of the latter. His *Astyanax oligolepis* is very probably *Astyanax steindachneri* Eigenmann; it certainly is not the *oligolepis* of Günther. *Tetragonopterus ovalis* is probably a *Moenkhausia*.

13. — *Coscinoxyron* is probably a valid genus, differing from *Chalcinus* in the increased number of gill-rakers.

¹ It is very probable that *Tetragonopterus bairdii* and *T. tabatingae* belong to this genus.

² The following description is based on the type in the British Museum.

Jaws equal, the lower not included; premaxillary with two series of teeth; mandible without conical teeth in front; gill rakers setiform; snout and maxillary forming more than half the length of the head; maxillary not slipping under preorbital for its entire length, the preorbital notched; maxillary with about 6 teeth; lateral line complete; maxillary-premaxillary border without a distinct angle. Differing from *Hollandichthys* and *Pseudochalceus* in its complete lateral line and incompletely toothed maxillary, from *Creotochanes* in its complete lateral line, notched preorbital and unangulated premaxillary-maxillary border.

14. — Thoracocharax, proposed as a subgenus of Gasteropelecus because the "Anterior profile of back [is] convex," is a distinct genus characterized by its dentition and not by the degree of the convexity of the back.

15. — Cyrtoscharax is synonymous with Cynopotamus, a subgenus of Charax. The type of Cynopotamus lacks a second row of teeth in the lower jaw.

16. — Eucynopotamus may be used for the genus hitherto known by the name Cynopotamus, since the type of this genus does not possess the generic characters distinguishing the other species hitherto relegated to this genus from Charax. The division of this genus into a subgenus with less than 75 scales and another with more is not fortunate, since the scales are 76–77, 79–97, 110–120 and 115 respectively in *gulo*, *knerii*, *magdalenae* and *humeralis*.

17. — Cynocharax, a new *subgenus* of Roetoides, I am unable to pass judgment upon in the absence of material and through the neglect of Dr. Fowler to state what species it includes.

18. — The subgenus Sphyraenocharax is said to be distinguished by having the depth $3\frac{1}{2}$ to 4 in the length. It apparently consists of *brachycephalus* and *abbreviatus*, with the latter the type. The teeth are too imperfectly redescribed to place them. Cope's figure of *brachycephalus* shows it to be allied to the type of Acestrorhamphus. The character of the teeth of *abbreviatus* is still in doubt. Cope says: "There are two distinct large canines on the anterior part of the maxillary bone and four smaller ones; maxillary teeth are minute." Presumably the first "maxillary" is a misprint for *premaxillary*. Fowler says: "about 6 well developed [canines] in the upper" jaw. This species is also allied to the type of Acestrorhamphus. Now the type of Acestrorhamphus has a depth of $3\frac{1}{2}$, other species of the genus have a depth of 4 and I am unable to discover the semblance of an excuse for the name Sphyraenocharax.

19. — Belonocharax is a new genus based on specimens from the Truando, Rio Atrato basin. These same specimens were referred to by Gill (in 1861 I think), as Ctenolucius. Admitting that Gill's name, being undefined, has no standing, there is no excuse for passing over the *Luciocharax (insculptus)* of Stein-

dachner, defined and figured in his *Fischfauna des Magdalenen-Stromes*, p. 51, pl. XIII, figs. 2-2b, which is unquestionably the genus to which *Belonocharax beani* belongs, *beani* being probably identical with the type *insculptus*.

20, 21, 22. — I do not have the material to pass finally on the status on the subgenus (20) Waiteina and the genus (21) Reganina; both are apparently Colosoma, as (22) Starksina is probably a Mylosoma.

24. — The genus Sealeina is probably a valid subgenus of Metynnis.

The paper closes with descriptions and figures of Cope's two species of Stethaprion. The figures lack details of the predorsal spines which are essential. No attempt is made to compare critically these two species and pass judgment as to whether the one is simply a younger specimen ($2\frac{13}{16}$ in.) than the other ($3\frac{9}{16}$ in.) although no one else is in as good a position to do so.

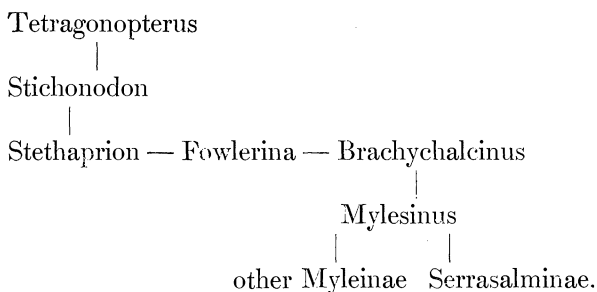
The descriptions of Cope, pieced out with those here presented and the numerous figures, will enable us without prejudice to work out finally in most cases what species are really under consideration.

We must feel grateful to Dr. Fowler for his labor. But it is to be hoped that in the future he will be more conservative in adding names to the science of ichthyology. The valid names do not compensate for the work imposed on some one else to separate them from the synonyms.

An examination of Boulenger's types of Brachyhalcinus shows them to belong to two distinct genera. Referring Boulenger's name to the species figured by him, the other species is congeneric with Günther's *Tetragonopterus compressus* and most nearly allied to Cope's Stethaprion. In recognition of Dr. Fowler's generous effort I would propose, using a form adopted by Dr. Fowler, the name Fowlerina to distinguish the genus represented by the *Tetragonopterus compressus* Günther.

The members of the Stethaprioninae mark the direct road from the genus Tetragonopterus (Tetragonopterinae) in its narrowest sense to the Myleinae and Serrasalminae. In the deep *Tetragonopterus argenteus* the post-ventral region is trenchant, the pre-ventral region flat. In Stichonodon both pre-ventral

and post-ventral regions are trenchant. In Stethapron, Brachychalcinus and Fowlerina the post-ventral region is incipiently serrate and there is a pre-dorsal spine. In Mylesinus of the Myleinae the abdomen is serrate behind the ventrals and in the rest of the Myleinae and the Serrasalminae the ventral edge is serrate both in front and behind the ventrals. The descent is indicated as follows



The genera of Stethaproninae are distinguished as follows.

- a. No predorsal spine; caudal scaled; origin of anal posterior to dorsal. Stichonodon.
- aa. A predorsal spine.
 - b. Predorsal spine long, slender, spear-shaped, fitting into a groove in the back; origin of anal under dorsal; scales rather small, over 60 in the lateral line.
 - Stethapron.
 - bb. Predorsal spine scale-like, spoon or saddle-shaped, concave below, fitting into a notch in the back. Caudal scaled; scales less than 40. Fowlerina.
 - bbb. Predorsal spine trigger or hammer-shaped, its free portion forming a longer anterior and shorter posterior branch, both of which are sharply pointed; caudal scaled; scales large, about 40. Brachychalcinus.